

DECLASS & Rev.  
**SECRET**  
By Licensing & Review

## ABSTRACT OF THE DISCLOSURE

02 A target tracking device for target tracking missiles having an electro-optical seeker assembly mounted in a missile structure through gimbals. The seeker assembly responds to target radiation and provides target deviation signals. Actuators, controlled by the target deviation signals, cause the seeker assembly to track the target. The electro-optical seeker assembly is pivotally mounted in the missile structure about a roll axis and a pitch axis only, the pitch axis being orthogonal to the roll axis. First and second pick-offs, providing pick-off signals, are provided for picking off angles of rotation of the seeker assembly about the roll and pitch axes. A structure-fixed inertial sensor unit is provided for measuring the angular rates about three mutually orthogonal axes and providing angular rate signals. The target deviation signals from the seeker assembly, the pick-off signals from the pick-offs and the angular rate signals from the inertial sensor unit are applied to a computer, which is programmed to define a seeker reference system with three degrees of freedom. This seeker reference system is decoupled from movements of the missile and the seeker assembly. The roll movement of the seeker reference system is zero. The seeker reference system is caused to track a target detected by the seeker assembly. The computer, in addition, generates positioning commands for the actuators depending on the position of the seeker reference system. The device for generating the positioning command is a case discriminating logic for selecting one of a plurality of specific positioning commands, when the target approaches the roll axis.

DECLASS & Rev.  
**SECRET**  
By Licensing & Review

29

Document 47251-014-9(a)